

46. (Unchanged) The three dimensional display of claim 25, wherein the controller receives an input image that is coded in a three dimensional coordinate system.
47. (Unchanged) The three dimensional display of claim 46, wherein the input image is received from one of a computer, television signal receiver, cable system receiver, satellite receiver, and a storage medium.
48. (Unchanged) The three dimensional display of claim 46, wherein the control system pixelizes the input image for reproduction by the three dimensional display.
49. (Unchanged) The three dimensional display of claim 25, wherein the light emitting elements are formed into a matrix having a cube shape.

### **REMARKS**

Claims 1-49 are pending in the present application. Reconsideration of the claims is respectfully requested in view of the following remarks.

#### **I. Allowable Subject Matter**

Applicant thanks Examiner Nguyen for the indication of allowable subject matter in claims 5-18, 24, 28, 30-44 and 49. However, for the reasons stated hereafter, Applicant respectfully submits that all of claims 1-49 contain allowable subject matter. Accordingly, claims 5-18, 24, 28, 30-44 and 49 have not been amended to be in independent form at this time.

#### **II. Telephone Interview**

On July 12, 2002, Applicant's representative telephone Examiner Nguyen requesting a telephone interview to discuss the distinctions of the present claims over the art of record. However, an interview with Examiner Nguyen and his supervisor or

Primary Examiner was not scheduled prior to the due date for filing this Response. Applicant still wishes to conduct the telephone interview and respectfully requests that the Examiner contact Applicant's representative to schedule the telephone interview as soon as possible.

### **III. Objection to the Drawings**

The Office Action objects to the drawings indicating that the drawing must show an input image coded, a computer, a television signal receiver, a cable system receiver, a satellite receiver, a storage medium, and a control system that pixelizes the input image for the 3D display. Applicant respectfully submits that Figure 4 depicts a control system that pixelizes the input image for the 3D display (see also page 15, line 23 to page 17, line 1 which discusses Figure 4). Moreover, Figure 4 depicts an input image interface 420 through which an input image is received from any of a plurality of different image sources including those noted above (page 16, lines 10-15). This input image may be coded for display in three dimensions, such as three dimensionally rendered objects, such as three dimensionally rendered objects which are coded in three dimensions (see page 16, lines 16-21 of the present specification).

In accordance with the Examiner's requirement to provide proposed drawing corrections to overcome the objection, attached hereto is a proposed amendment to Figure 4 illustrating an image source with an arrow indicating a input data that is optionally coded for three dimensional display. Applicant respectfully requests approval of the drawing amendment and withdrawal of the objection to the drawings.

### **IV. 35 U.S.C. § 103, Alleged Obviousness in View of Harrold '861**

The Office Action rejects claims 1 and 25 under 35 U.S.C. § 103(a) as being unpatentable over Harrold (U.S. Patent No. 6,281,861). This rejection is respectfully traversed.

As per independent claims 1 and 25, the Office Action states:

As to claim 1, Harrold teaches a three dimensional (3D) display device which includes the matrix of the triangles 6, 8, 9 representing three dimensional red, green, blue (RGB) pixels matrix (see col. 5, lines 38-43), the dimensional of triplets of RGB pixels have R pixel and B pixel as claimed as a base, an array 20 of pixels arranged as rows and columns, as illustrated in Fig. 8, connected to a controller 25 and a driver circuit 22 for controlling addressing of the pixels (col. 5, lines 46-48). It would have been obvious to a person of ordinary skill in the art to recognize that Harrold discloses as claimed as three dimensional red, green, blue (RGB) pixels array 20 may comprise light-emitting pixels because for the flat CRT, three dimensional red, green, blue (RGB) pixels array 20 may be applied as an electroluminescent device (see col. 6, lines 46-50) because the modular may also be applied in light emitting technology with each picture elements having a light emitting element as claimed as a 3D matrix of light emitting elements (see col. 3, lines 19-21).

As to claim 25, Harrold teaches a three dimensional (3D) display device which includes a plurality of matrix of the triangles 6, 8, 9 representing three dimensional red, green, blue (RGB) pixels matrix (see col. 5, lines 38-43), three dimensional red, green, blue (RGB) pixels array 20 may comprise light-emitting pixels because for the flat CRT, three dimensional red, green, blue (RGB) pixels array 20 may be applied as an electroluminescent device (see col. 6, lines 46-50), a plurality three dimensional red, green, blue (RGB) pixels matrix arranged as rows and columns, as illustrated in Fig. 5, connected to a controller 25 and a drive circuit 22 for controlling addressing of the pixels (col. 5, lines 46-48). It would have been obvious to a person of ordinary skill in the art to recognize that Harrold discloses as claimed as three dimensional red, green, blue (RGB) pixels array 20 may comprise light-emitting pixels because for the flat CRT, three dimensional red, green, blue (RGB) pixels array 20 may be applied as an electroluminescent device (see col. 6, lines 46-50) because the modular may also be applied in light emitting technology with each picture elements having a light emitting element as claimed as a 3D matrix of light emitting elements (see col. 3, lines 19-21).

The Harrold '861 reference was discussed at length in the Response filed January 21, 2002. As discussed, Harrold teaches a spatial light modulator and directional display for generating autostereoscopic three dimensional displays. An autostereoscopic display makes use of interlaced stereo pairs of images (i.e., a pair of images corresponding to views through the left and right eyes) in a two dimensional display. The stereo pairs are interlaced in alternate columns in a two-dimensional image. A lenticular lens is placed in front of the interlaced image. The lenticular lens is an array of very narrow vertical cylindrical lenslets spaced to correspond to the columns of the interlaced stereo pair. In

this manner, the appropriate images of the stereo pair are directed to the proper eyes, thus generating a three-dimensional image using a two dimensional display.

Thus, Harrold is directed to using a two dimensional display to generate the appearance of a three dimensional image - not an actual three dimensional display but a visual illusion of three dimensions. This is clear from the text and figures of Harrold where Harrold specifically states that the array of LCD/ELD pixels 20 (see Figure 9) is an array of pixels arranged as rows and columns as illustrated in Figure 5 (column 5, lines 45-47). Furthermore, all of the figures in Harrold show two dimensional arrays of pixels, not three dimensional matrices of light emitting elements.

To the contrary, the present invention, as recited in independent claims 1 and 25, makes use of a three dimensional matrix of light emitting elements. This feature is not taught or suggested by Harrold. Thus, while the Harrold mechanism is used to generate a three dimensional image, as perceived by a viewer, in actuality Harrold is using a two dimensional array of pixels that are interlaced to trick the viewer's eye into perceiving the image as a three dimensional image. The present invention, however, provides a true three dimensional image through use of a three dimensional matrix of light emitting elements. The mechanism of Harrold is not capable of generating a true three dimensional image.

Furthermore, it would not have been obvious to one of ordinary skill in the art to modify Harrold to include a three dimensional matrix of light emitting elements. The mechanism of Harrold is specifically designed to be used with a two dimensional array of pixels. Harrold provides no teaching or suggestion that the apparatus and method described may be extended to be used with a three dimensional matrix of light emitting elements. Moreover, it is not at all clear how one would, if motivated to do so, extend the teachings of Harrold to a three dimensional matrix of light emitting elements. To do so would render the mechanism in Harrold inoperable since the methodology of the Harrold invention is based on the interlacing of pixels in a two dimensional array of pixels.

Thus, Harrold does not teach or suggest all of the features recited in independent claims 1 and 25. Accordingly, Applicant respectfully requests withdrawal of the rejection of claims 1 and 25 under 35 U.S.C. § 103(a).

**V. 35 U.S.C. § 103, Alleged Obviousness in View of Harrold '861 and '315**

The Office Action rejects claims 1, 2, 25 and 26<sup>1</sup> under 35 U.S.C. § 103(a) as being unpatentable over Harrold et al. (U.S. Patent No. 6,023,315) in view of Harrold (U.S. Patent No. 6,281,861). This rejection is respectfully traversed.

With regard to independent claims 1 and 25, the Office Action states:

As to claim 1, Harrold '315 teaches a three dimensional (3D) display device which includes the matrix of the triangles 21, 22, 23 representing three dimensional red, green, blue (RGB) pixels matrix (see col. 5, lines 38-43), the dimensional of triplets of RGB pixels have row electrodes R1, R2 disposed on one substrate and facing zigzag column electrodes C1, C2 disposed on a facing substrate as claimed as a base (figure 1, col. 4, lines 36-39). Harrold et al. '315 fails to teach a base having electrical circuitry for powering and controlling the three dimensional matrix. However, Harrold '861 teaches an electroluminescent device (ELD) having three dimensional red, green, blue (RGB) pixels arranged as rows and columns, as illustrated in Fig. 8, are controlling and driving by a data ordering circuit 25 and a driver circuit 22 (see figure 9). It would have been obvious to a person of ordinary skill in the art to incorporate the controller 25 and driver circuit 22 taught by Harrold '861 for driving the row electrodes R1, R2 and column electrodes C1, C2 of Harrold '315 in order to control an autostereoscopic three dimensional display because spatial light modulators also include devices which emit light of controllable intensity such as electroluminescent device (col. 1, lines 16-18 of Harrold '861).

As to claim 25, Harrold '315 teaches a three dimensional (3D) display device which includes a plurality of matrix of the triangles 21, 22, 23 representing three dimensional red, green, blue (RGB) pixels matrix (see col. 5, lines 38-43). Harrold et al. '315 fails to teach a base having electrical circuitry for powering and controlling the three dimensional matrix. However, Harrold '861 teaches an electroluminescent device (ELD) having three dimensional red, green, blue (RGB) pixels arranged as rows and columns, as illustrated in Fig. 8 are controlling and driving by a data ordering circuit 25 and a driver circuit 22 (see figure 9). It would have been obvious to a person of ordinary skill in the art to incorporate the controller 25 and driver circuit 22 taught by Harrold '861 for driving the row electrodes R1, R2 and column electrodes C1, C2 of Harrold '315 in order to control an autostereoscopic three dimensional display device

---

<sup>1</sup> Even though the statement of the rejection in the Office Action only includes claims 1 and 25, paragraph 10 of the Office Action references claims 2 and 26 and thus, it is Applicant's understanding that these claims were intended to be within the statement of the rejection.

because spatial light modulators also include devices which emit light of controllable intensity such as electroluminescent device (col. 1, lines 16-18 of Harrold '861).

Both Harrold '861 and '315 teach two dimensional arrays of elements as is clearly shown in their respective figures and corresponding text. The Office Action appears to assume that simply because Harrold '861 and '315 teach arrays of elements that produce a stereoscope three dimensional image, somehow this is the same as a three dimensional matrix of light emitting elements. Applicant respectfully disagrees.

The arrays in Harrold '861 and '315 are only two dimensional – arranged by row and column. There is no depth component to the arrangement of elements in either of the Harrold '861 or '315 references. Rather, the columns of the Harrold '861 and '315 are arranged in an interlaced manner such that columns are zig-zagged vertically, as illustrated, for example, in Figure 1 of '315 and Figure 4 of '861. Even though the columns are zig-zagged vertically, they are still arranged in two dimensions. Even though the two dimensional arrays of elements in Harrold '861 and '315 are designed to trick the human eye into perceiving a three dimensional image with the aid of a lenticular lens, they are still physically two dimensional arrays. They are not a three dimensional matrix of light emitting elements capable of generating images in three dimensions, as recited in claims 1 and 25.

Furthermore, it would not have been obvious to one of ordinary skill in the art to modify Harrold '315 and/or Harrold '861 to include a three dimensional matrix of light emitting elements. The mechanism of Harrold '315 and '861 is specifically designed to be used with a two dimensional array of pixels for generating stereoscopic three dimensional images. Harrold '315 and '861 provide no teaching or suggestion that the apparatus and methods described may be extended to be used with a three dimensional matrix of light emitting elements. Moreover, it is not at all clear how one would, if motivated to do so, extend the teachings of Harrold '315 and '861 to a three dimensional matrix of light emitting elements. To do so would render the mechanism in Harrold '315 and '861 inoperable since the methodology of the Harrold '315 and '861 inventions is based on the interlacing of pixels in a two dimensional array of pixels for generating stereoscope three dimensional images.

Thus, Applicant respectfully submits that neither Harrold '315 or '861, either alone or in combination, teach or suggest the features of independent claims 1 and 25. At least by virtue of their dependency on claims 1 and 25, respectively, neither Harrold '315 or Harrold '861 teach or suggest the features of dependent claims 2 and 26. Accordingly, Applicant respectfully requests withdrawal of the rejection of claims 1, 2, 25 and 26 under 35 U.S.C. § 103(a).

**VI. 35 U.S.C. § 103, Alleged Obviousness in View of Harrold '315 and Jager**

The Office Action rejects claims 3, 4, 19-22, 27, 29 and 45-47<sup>2</sup> under 35 U.S.C. § 103(a) as allegedly being unpatentable over Harrold '315<sup>3</sup> in view of Jager et al. (U.S. Patent No. 6,288,694). This rejection is respectfully traversed.

Harrold '315 is discussed above. Jager does not provide for the deficiencies of Harrold '315. Jager teaches a flat display screen system for suppressing moiré effects. Jager, like Harrold '315 and Harrold '861, is directed to a display that utilizes a two-dimensional array of light emitting elements. There is nothing in Jager that teaches or even suggests a three dimensional matrix of light emitting elements capable of generating images in three dimensions. Since neither Harrold '315 nor Jager teaches a three dimensional matrix of light emitting elements, any alleged combination of Harrold '315 and Jager still would not teach this feature.

Thus, the alleged combination of Harrold '315 and Jager, even if such a combination were possible and one were motivated to make such a combination, would still not teach the features of independent claims 1 and 25 from which claims 3, 4, 19-22, 27, 29 and 45-47 depend, respectively. Accordingly, Applicant respectfully requests withdrawal of the rejection of claims 3, 4, 19-22, 27, 29 and 45-47 under 35 U.S.C. § 103(a).

---

<sup>2</sup> Even though the statement of the rejection in the Office Action only includes claims 3 and 27, paragraphs 13-16 of the Office Action reference claims 4, 19-23, 29, 45-48 and thus, it is Applicant's understanding that these claims were intended to be within the statement of the rejection.

<sup>3</sup> It is unclear as to the basis of the rejections of claims 19-22 and 45-47 since the rejections of these claims appear under the statement of the rejection based on Harrold '315 and Jager, but the actual rejection of these claims refers to Harrold '861.

Moreover, neither Harrold '315, '861<sup>4</sup> nor Jager, either alone or in combination, teach the features of dependent claims 21-22 or 46-48. Neither Harrold '315, '861 nor Jager teach or suggest an input image that is coded in a three dimensional coordinate system. The Office Action alleges that Harrold '861 teaches this feature in the data ordering circuit 25. However, there is nothing in Harrold '861 that teaches or suggests that the data ordering circuit 25 codes an image in a three dimensional coordinate system. All that is stated in Harrold '861 regarding the data ordering circuit 25 is that "the shift register 24 has a data input connected to the output 25a of a data ordering circuit 25 for supplying video signals in the appropriate serial format for the multiphase addressing" (column 5, lines 59-61).

There is nothing in Harrold '861, Harrold '315 or Jager, that teaches or suggests coding an image in a three dimensional coordinate system. This is because Harrold '861, Harrold '315 and Jager are all directed to two-dimensional displays.

**VII. 35 U.S.C. § 103, Alleged Obviousness in View of Harrold '315, '861, Jager and Applicant's Allegedly Admitted Prior Art**

The Office Action rejects claims 23 and 48 as being unpatentable under 35 U.S.C. § 103(a) over Harrold '861<sup>5</sup>, Harrold '315, Jager, and Applicant's Allegedly Admitted Prior Art. This rejection is respectfully traversed.

Harrold '861, Harrold '315 and Jager have been discussed above. Applicant's allegedly admitted prior art referred to by the Office Action appears on page 16 of the present specification which is in the Detailed Description of the Preferred Embodiment. Page 16 is not prior art. Furthermore, the description of the operation of the controller 410 and display interface 430 on page 16 is not prior art. Rather, the description on page 16 referencing Figure 4 is a description of the operation of an embodiment of the present invention, not prior art. The Examiner cannot rely on a description of the present invention as allegedly providing teachings of the prior art.

---

<sup>4</sup> Again, because of the unclear nature of the rejection, Applicant is also addressing Harrold '861 as being a basis of the rejection of these claims in order to expedite prosecution of the application.

<sup>5</sup> Although the Office Action refers to "Harrold '816" it is believed that the Office Action intended to reference Harrold '861.



Thus, since the Office Action admits that none of Harrold '861, Harrold '315 and Jager teach "the control system pixelizes the input image for reproduction by the three dimensional display," and the Office Action erroneously relies on teachings of the present invention, Applicant respectfully submits that the Office Action has not established a prima facie case of obviousness with regard to claims 23 and 48. Furthermore, it would not be obvious to modify Harrold '861, '315 or Jager to include such a feature, without relying on the teachings of the present invention, because none of Harrold '861, '315 or Jager even teach or suggest a three dimensional display and thus, do not have any need for a control system that pixelizes an input image for reproduction on a three dimensional display. Accordingly, Applicant respectfully requests withdrawal of the rejection of claims 23 and 48 under 35 U.S.C. § 103(a).

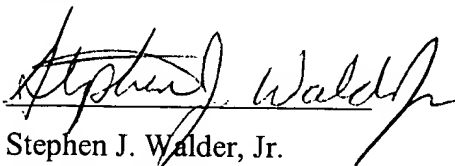
#### **VIII. Conclusion**

It is respectfully urged that the subject application is patentable over Harrold '861, Harrold '315 and Jager and is now in condition for allowance. The Examiner is invited to call the undersigned at the below-listed telephone number if in the opinion of the Examiner such a telephone conference would expedite or aid the prosecution and examination of this application.

DATE:

July 22, 2002

Respectfully submitted,



Stephen J. Walder, Jr.

Reg. No. 41,534

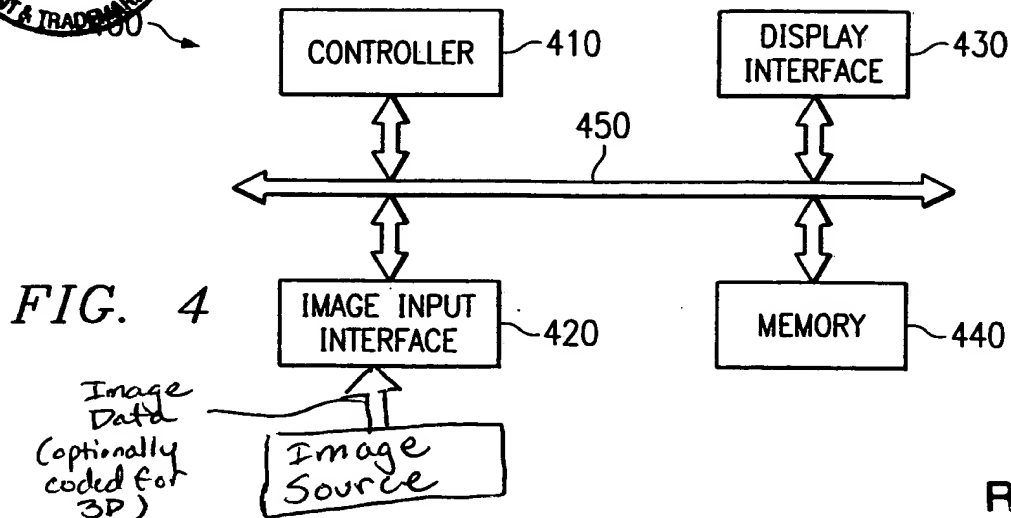
Carstens, Yee & Cahoon, LLP

P.O. Box 802334

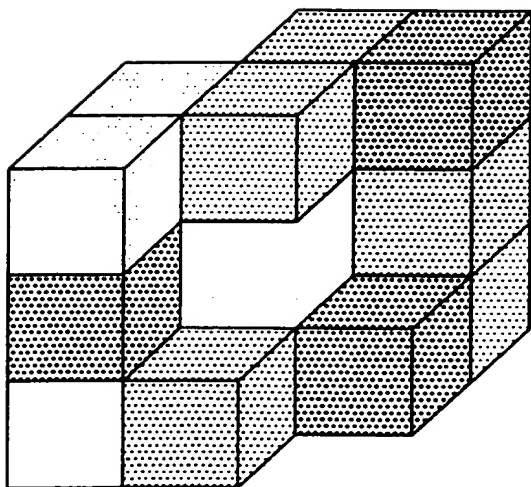
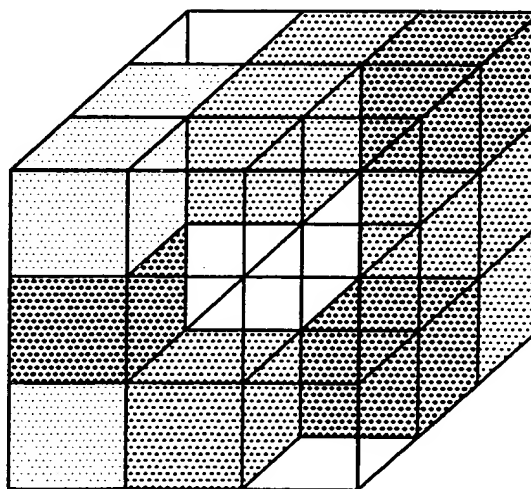
Dallas, TX 75380

(972) 367-2001

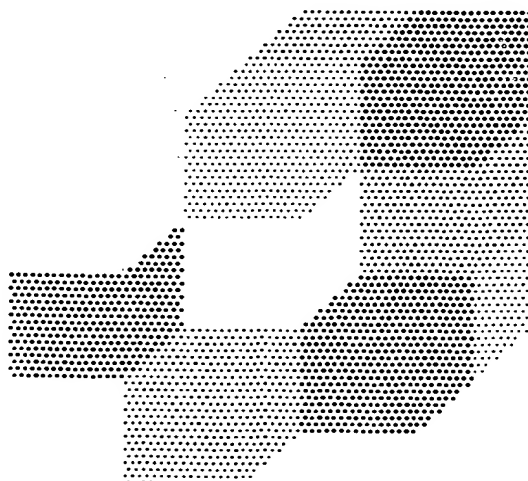
Attorney for Applicant



**FIG. 5A**



**FIG. 5B**



**FIG. 5C**

RECEIVED  
JUL 31 2002  
Technology Center 2600